



... web driven nuclear science

Mass Activity Calculator

(J. Magill)

Exercises

Problems to be solved using the Mass Activity Calculator

1. Calculate the specific activities of C-14 and S-35?

After what time is the activity reduced by 50%?

2. The activity of Sr-90 is 18,000 transformations per minute. What is the mass of Sr-90?

After what time is the activity reduce to 25% of its initial value?

3. 6 g of carbon from a piece of wood found in an ancient temple is analyzed and found to have an activity of 10 transformations per minute per gram (from C-14). How many atoms of C-14 are present in the sample and what is their mass?
4. The environmental burden of C-14 is as follows: In the atmosphere 4 MCi, in plants 13 MCi, in the oceans 240 MCi. What are the masses of C-14 in a) the atmosphere b) in plants and c) in the oceans?
5. The concentration of potassium (K) in humans is about 1.7 g/kg. How much potassium does an average person (weight 80 kg) contain? What is the abundance of K-40 in natural potassium? What is the mass and activity of K-40 in this person?
6. Calculate the specific activities of H-3, Sr-90, U-238?
7. What is the maximum alpha particle emission rate from 1 μ g Ra-226?
8. Three hundred MBq of Po-210 are required for an ionisation source. What is the mass of Po-210?
9. How many grams of Y-90 are in secular equilibrium with 1 mg Sr-90?